

AUG 30 2007

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

- 1 1. (original) A method for use in watermarking a video signal, the method
2 comprising the steps of:
3 replicating at least selected ones of bits of additional information to be impressed
4 upon a video signal by placing said bits into at least one selected bit of an average value
5 of a chrominance portion over a block of said video signal; and
6 supplying said original and replicated bits to be impressed in the same block
7 position in successive frames.
- 1 2. (original) The invention as defined in claim 1 wherein said block position is
2 based on said video signal having one Y, one U and one V value for every 2x2 block of
3 full resolution of an original input video signal.
- 1 3. (original) The invention as defined in claim 1 wherein all of said bits of
2 additional information that are to be impressed on a first one of said successive frames
3 are replicated to be impressed on at least a second one of said successive frames that is
4 for display without any frame being displayed between said first frame and said second
5 ones of said successive frames.
- 1 4. (original) The invention as defined in claim 1 further comprising the step of
2 adding an offset bias to an average value of a chrominance portion of at least one block of
3 at least one frame of said successive frames that have said original and replicated bits
4 impressed upon them in the same block positions.
- 1 5. (original) The invention as defined in claim 4 wherein said offset bias is
2 independent of a busyness measure of said block.

1 6. (original) The invention as defined in claim 4 wherein said offset bias is
2 independent of any value added to said average value to bring said average value within a
3 safe range.

1 7. (original) The invention as defined in claim 4 wherein said offset bias is a first
2 offset bias that is a positive value added to a first one of said successive frames, and
3 wherein said method further comprises the step of adding a second offset bias to an
4 average value of a chrominance portion of at least one block of at least a second frame of
5 said successive frames that have said original and replicated bits impressed upon them in
6 the same block positions, said second offset bias being a negative value.

1 8. (original) The invention as defined in claim 4 wherein said offset bias is a first
2 offset bias that is a positive value added to a first one of said successive frames, and
3 wherein said method further comprises the step of adding a second offset bias to an
4 average value of a chrominance portion of at least one block of at least a second frame of
5 said successive frames that have said original and replicated bits impressed upon them in
6 the same block positions, said second offset bias being a negative value and said at least
7 one block of said at least second frame being like-positioned within said at least second
8 frame as said at least one block of said first frame.

1 9. (original) The invention as defined in claim 4 wherein said offset bias is small
2 relative to the change required in said average value to place said bits into said at least
3 one selected bit of an average value.

1 10. (original) The invention as defined in claim 4 wherein additions are made to
2 the chrominance portion of ones of the pixels of said at least one block until total of such
3 additions equals the product of said offset bias and the number of pixels in a block, said
4 additions being independent of any other changes made to the chrominance portion of
5 said ones of the pixels.

1 11. (original) The invention as defined in claim 1 further comprising the step of
2 including a prescribed data sequence within said additional information to be impressed
3 upon a chrominance portion of said video signal.

1 12. (original) The invention as defined in claim 11 wherein said prescribed data
2 sequence is known to a receiver of said video signal after it is watermarked.

1 13. (original) The invention as defined in claim 11 wherein said prescribed data
2 sequence is a Barker sequence.

1 14. (original) The invention as defined in claim 11 wherein said prescribed data
2 sequence is impressed, at least in part, upon prescribed blocks of at least one frame of
3 said video signal.

1 15. (original) The invention as defined in claim 11 wherein said prescribed data
2 sequence is impressed in its entirety upon prescribed blocks of one frame of said video
3 signal.

1 16. (original) The invention as defined in claim 11 wherein said prescribed data
2 sequence is impressed upon like-positioned prescribed blocks of multiple ones of frames
3 of said video signal.

1 17. (original) The invention as defined in claim 11 wherein replicas of said
2 prescribed data sequence in its entirety are impressed upon like-positioned prescribed
3 blocks of respective ones of multiple frames of said video signal.

1 18. (original) The invention as defined in claim 1 further comprising the step of
2 including a known data sequence within said additional information to be impressed upon
3 a chrominance portion of said video signal, wherein said known data sequence is
4 intermixed among said additional information so as to be scattered among the blocks of a
5 frame.

1 19. (original) The invention as defined in claim 1 further comprising the step of
2 including a known data sequence within said additional information to be impressed upon
3 a chrominance portion of said video signal, wherein said known data sequence is
4 intermixed among said additional information so as to be scattered among the blocks of a
5 frame, said scattering being different for different suppliers of said additional
6 information.

1 20. (original) A method for use with a receiver of a video signal containing
2 additional information impressed upon a chrominance portion of said video signal, the
3 method comprising the step of:
4 combining extracted initial additional information of like block positions from
5 prescribed frames to determine the final additional information;
6 supplying as an output said final additional information.

1 21. (original) The invention as defined in claim 20 wherein said prescribed
2 frames are successive frames.

1 22. (original) The invention as defined in claim 20 wherein said prescribed
2 frames are successive frames as transmitted in said video signal.

1 23. (original) The invention as defined in claim 20 wherein said prescribed
2 frames are successive frames when displayed.

1 24. (original) The invention as defined in claim 20 further comprising the step of
2 determining a quality of each of said prescribed frames that are combined in said
3 combining step; and
4 wherein in said combining step said initial additional information of like block
5 positions from said prescribed frames is combined as a function of said determined
6 quality for each of said prescribed frames.

1 25. (original) The invention as defined in claim 21 wherein said determined
2 quality for each of said frames is a function of the number of errors in each of said frames
3 for a known data sequence which is embedded in expected ones of the blocks of each of
4 said frames.

1 26. (original) The invention as defined in claim 21 wherein when said determined
2 quality for a frame is below a prescribed threshold, said frame is treated as if it contains
3 no additional information.

1 27. (original) The invention as defined in claim 21 wherein said determined
2 quality is expressed as a weight value, one weight value being developed for each frame.

1 28. (original) The invention as defined in claim 21 wherein said final additional
2 information is supplied to a channel decoder which treats said final additional
3 information as soft bits.

1 29. (original) Apparatus for use in watermarking a video signal, comprising:
2 means for replicating at least selected ones of bits of additional information to be
3 impressed upon a video signal by replacing a selected bit of an average value of a
4 chrominance portion over a block of said video signal; and
5 means for supplying said original and replicated bits to be impressed in the same
6 block position in successive frames.

1 30. (original) A method for use in watermarking a video signal, the method
2 comprising the steps of:
3 inserting in prescribed block positions of prescribed frames of said video signal at
4 least one unique identifying code by replacing a selected bit of an average of a
5 chrominance portion over said blocks.

1 31. (original) The invention as defined in claim 30 wherein said identifying code
2 is a Barker sequence.

1 32. (original) The invention as defined in claim 30 wherein said prescribed code
2 identifies said prescribed frames as belonging to a unitary sequence.

1 33. (original) The invention as defined in claim 30 wherein said prescribed code
2 identifies said prescribed frames as belonging to a unitary sequence, and said method
3 further comprising the step of:

4 inserting in other prescribed block positions of said prescribed frames at least one
5 secondary unique identifying code by replacing a selected bit of an average of a
6 chrominance portion over said blocks.

1 34. (original) The invention as defined in claim 33 wherein said at least one
2 secondary unique identifying code is made up of a series of codes that distinctly identifies
3 individual frames of said prescribed frames.

1 35. (original) The invention as defined in claim 33 wherein said at least one
2 secondary unique identifying code is made up of a series of codes that distinctly identifies
3 groups of frames of said prescribed frames, at least one of said groups of frames including
4 a plurality of frames.

1 36. (currently amended) A receiver for extracting additional information from a
2 video signal containing said non-video information impressed upon a chrominance
3 portion of said video signal, comprising
4 an extractor for extracting said non-video information from said video signal; and
5 a sequence processor receiving at least said extracted non-video information and
6 detecting at least one prescribed sequence that was impressed upon at least one frame of
7 said video signal and for determining a number of errors in said at least one prescribed
8 sequence for each of a plurality of grouped frames: and
9 a frame weighting unit which uses a per-frame quality measure derived as a
10 function of said number of errors in each of said plurality of frames to combine extracted
11 like-block positioned non-video information from said plurality of frames into an output
12 value for said block position for said grouped frames.

1 37. (canceled)

1 38. (currently amended) ~~The invention as defined in claim 36 wherein said~~
2 ~~sequence processor determines a number of errors in said at least one prescribed sequence~~
3 ~~for each of a plurality of grouped frames, said receiver further comprising:~~

4 A receiver for extracting additional information from a video signal containing
5 said non-video information impressed upon a chrominance portion of said video signal,
6 comprising

7 an extractor for extracting said non-video information from said video signal; and

8 a sequence processor receiving at least said extracted non-video information and

9 detecting at least one prescribed sequence that was impressed upon at least one frame of

10 said video signal and for determining a number of errors in said at least one prescribed

11 sequence for each of a plurality of grouped frames;

12 a frame weighting unit which uses a per-frame quality measure derived as a

13 function of said number of errors in each of said plurality of frames to combine extracted

14 like-block positioned non-video information from said plurality of frames into a soft data

15 output value for said block position for said grouped frames; and

16 a channel decoder for decoding said soft values.

1 39. (new) A method for use in watermarking a video signal, the method
2 comprising the steps of:

3 replicating at least one bit of additional information to be impressed upon said
4 video signal;

5 supplying said original and replicated bits in a manner so that they are to be
6 impressed in the same block position in successive frames;

7 wherein said original and replicated bit are each impressed upon their respective
8 block of said video signal by placing their respective values in at least one bit position of
9 an average value of a chrominance portion over said respective blocks.